

REMARKS

First, Applicant's Attorney thanks the Examiner for the lengthy and courteous Interview of December 7, 2000, including Applicant's proposed additions to the specification from Applicant's originally filed Claims 9-21, pursuant to MPEP 608.01(1).

This Rule 116 Amendment is made in response to the Final Office Action of September 12, 2000. This Rule 116 Amendment is also made in conjunction with the filing of a further Continuing Prosecution Application (CPA) of the above identified application, which is a continuation-in-part of application serial no. 08/606,219, filed March 7, 1996, now US patent no. 5,786,642 of July 28, 1998, which was a continuation-in-part of application serial no. 08/328,574, filed October 24, 1994, now US patent no. 5,500,561, which was a continuation of application serial no. 08/129,575 filed September 29, 1993, now abandoned, which was a continuation of application serial no. 07/944,796, filed September 15, 1992, now abandoned, which was a continuation of application serial no. 07/638,637, filed January 8, 1991, now abandoned. These applications are incorporated by reference herein.

In view of the amendments herein to the claims and the following representations, reconsideration of the application in its present form is respectfully requested.

With respect to the prolix rejection, Applicant respectfully traverses this rejection and points out to the Examiner that the term prolix inherently and ordinarily means redundant and repetitive. Applicant further notes that claims 49-114 do not contain material that is either repetitive of or redundant with any material in claims prior to 49, and therefore none of the material in claims 49 - 114 is prolix.

However, as a good faith effort to focus the present application to specific content with closely related claims, the applicant has canceled Claims 1-4, 7, 9, 10, 16, 19, 22-31, 34-48, 57 - 88 and 91 - 114. For the convenience of the Examiner, these Claims are listed herein as "Canceled".

Applicant has voluntarily classified all of the Claims into distinct species for future reference, and proceeds only with respect to those Claims 49-56 and 89-90 referred unilaterally below by the Applicant as "Species 1".

Applicant reserves the right during the pendency of this application to file divisional and/or continuing patent applications to claim the subject matter herein voluntarily withdrawn.

However, for now, the Examiner can focus on a limited number of Claims.

This withdrawal is made only for the purpose of facilitating examination of this application on its merits and does not constitute the applicant's abandonment of any subject matter.

The claims remaining in this case after this voluntary partial withdrawal, are as follows: claims 49-56 and 89-90 after cancellation of the other Claims.

It is noted that independent Claim 49 has been amended to delete the term "Universal" when referring to the power system, and it now reads a "power system sharing AC and DC power for powering DC compatible loads."

Furthermore Claim 1 has been amended to correct a minor typographical error with regard to the power controller has a control circuit to charge the optional storage battery.

With respect to the Claims 49-114 which the Examiner rejected as prolix, Applicant points out that for convenient claim-mapping identification by the reader, Claims 49-114 of the instant application contains the following species:

Species 1 (embodied in Claims 49-56 and 89-90): A universal power control system having a power controller that converts primary AC or DC power to regulated DC power and also has one or more secondary alternative DC power source providing power to the DC loads (such as storage batteries or household appliances);

Species 2 (embodied in Claims 57-58): A stand-alone system with no central AC grid;

Species 3 (embodied in Claims 59, 62-64, 68-74, 75-81 and 82-86): A variety of DC power sources, such as solar in

claims 59, 62-64, fuel cell in claims 68-74, cogenerator in claims 75-81 and alternative DC power sources in claims 82-86;

Species 4 (embodied in Claims 60-61): Uninterruptible power sources.

Species 5 (embodied in Claims 65-67): DC to AC inverter;

Species 6 (embodied in Claim 91): Brownout and over-voltage mitigating system;

Species 7 (embodied in Claims 92-96): AC generator as a power source;

Species 8 (embodied in Claims 98-100): DC load types;

Species 9 (embodied in Claims 101-106): A unitary and modular package;

Species 10 (embodied in Claims 107-114): Emergency lighting system.

Therefore, for the purposes of simplifying the examination of the present application, Applicant only

requests that species 1 be reviewed at this time, as noted in Claims 49-56 and 89-90.

Applicant reserves the right to file divisionals as to the non-elected species.

With respect to the Examiner's statements that the Claims contain new matter, under 35 USC 112, first paragraph, the specification has now been amended at page 4, line 25, pursuant to MPEP 608.01(1), to add the subject matter of originally-filed claims 9-21, which were filed in the original parent application serial No. 08/820,496, filed March 19, 1997.

These claims 9-21 contain subject matter that is not new matter because the subject matter of the claims was present in the originally filed application as claims 9-21 directed to a DC power supply system, and not to a high-efficiency lighting system, as in Claims 1-8 of the originally-filed application. (Applicant notes that the prior Amendment also amended the specification at page 4, line 25, with a description of new proposed Figures 12-16, but coincidentally it is also appropriate to add the subject matter of originally filed Claims 9-21 here also at page 4, line 25.)

Up to the last two paragraphs of the additional specification text, all of which is derived from the subject matter of originally-filed claims 9-21, the material is literally translated from claims language into narrative English language prose.

In addition, with the last two paragraphs beginning with the word "Furthermore", applicant notes this material is inherent in the disclosure as originally filed on March 19, 1997 and also contained in the originally filed claims 9-21 directed to a DC power supply.

Support for the addition to the specification in this Rule 116 amendment is found in MPEP 608.01(1). That, in substance, states that an Applicant may rely on the original claims for the purposes of a written description, if their contents justifies it. Since the herewith added material was in the claims as originally filed, the content was present, and merely now remains in this case. As such, it is not new matter at all. These claims and the addition to the specification hereby made should not be rejected because the subject matter may have heretofore been lacking in the description or drawings. The material was present in the case because it was in the claims as originally filed, and the specification is hereby properly amended to include this subject matter, pursuant to MPEP 608.01(1).

In addition to being present in the originally filed Claims 9-21, the subject matter originally filed of Claims 9-21 here presented now in the specification at page 4, line 25 was also present in the two prior patent applications filed under Serial No. 08/606,219 filed March 7, 1996, now U.S. Patent No. 5,786,642 dated July 28, 1998 and application serial No. 08/328,574, filed Oct. 24, 1994, now U.S. Patent No. 5,500,561 of March 19, 1996 (which is based

upon earlier patent application serial numbers 08/129,575 dated September 29, 1993, and 07/944,796 of September 14, 1992 and 07/638,637 of January 8, 1991).

Therefore, the subject matter of the Claims herein is not new matter because it is found in originally filed Claims 9-21 of the above-identified patent application, as well as in the two earlier Wilhelm '561 and Wilhelm '642 patents for claims 9 and 13 as originally filed and claim 49 as amended in the present pending application.

For example, in seeking support from the two earlier patents for claims 9 and 13 as originally filed and claim 49 as amended in the present pending application, the following is noted:

In one approach Figure 10 is present in the presently pending application and support for this block diagram of Figure 10 can be found in the previous patents. Therefore, Applicant submits proposed red ink drawing changes to Figure 10 to include reference numerals for Figure 10 to further explain its contents. The specification has also been amended at page 7, line 28 to reflect these changes to Figure 10.

Support for the presently pending Figure 10 can be found in the prior patents. For example, in U.S. Patent No. 5,500,561 dated March 19, 1996, entitled "Customer Side Power Management System". In general, Figure 3 therein is similar to Figure 10 of the present pending application since it depicts a single phase (L1/L2) AC input. Figure 2

therein specifies a 3-phase AC supply. In Figure 3 of Wilhelm '561, the diode network 50, 52 and 54 are a good representation of a power junction means such as shown as reference numeral 55 in Figure 10 of the present pending application. The discussion on column 10 lines 55 to 65 of US patent no. 5,500,561 is relevant as is the expanded discussion of a similar circuit feature in Figure 2 which is found starting at col. 7 line 63 continuing to col. 8 line 59 therein.

Concerning U.S. Patent 5,786,642 dated July 28, 1998 entitled "Modular Power Management System", support for the rest of the blocks of Figure 10 of the present pending application is found in Figure 4 of Wilhelm '642.

For example, the discussion of optical isolator 510 can also be construed as relevant to the power junction means 55 of Figure 10 of the present pending application. This discussion can be found at col. 8 lines 23 to 33. Clearly control means 522 maps into control means 51 of Figure 10 and bridge rectifier network 501 maps into DC rectifier means 50 of Figure 10. The use of transformer 506 indicates the ability to supply low voltage DC and together with circuitry surrounding it, it qualifies as the voltage regulator means 52.

Furthermore, although no explicit mention of power factor correction 51 appears to be made in the two previous parent patents, PWM 503 can be controlled to perform this

function. The entire discussion of Figure 4 (col. 7 line 36 to col. 8 line 55) is relevant.

Concerning the subject matter of originally-filed Claim 9, which is now introduced into the specification herein pursuant to MPEP 608.01(l), please note the following: Figure 4 of Wilhelm '642 shows a power controller receiving AC and delivering low voltage DC to DC loads shown as "plugs". See col. 2 line 30 as to "low voltage 24 V DC".

Fig. 4 of Wilhelm '642 also shows converting AC to DC. For example, see rectifier in Figure 4, 501 and col. 7 lines 48 to 54 concerning the rectifier bridge circuit. The battery providing standby DC to the power controller and also delivering power to the DC loads in times of AC power outage are implied in Wilhelm '642 patent in the discussion of Figure 4. See specifically column 8, lines 34 to 37 and the discussion of mode 3 at column 8, on lines 39 to 40.

The discussion of Mode 1 of Wilhelm '642 at col. 8 lines 37 and 38 covers charging of the battery. The discussion of Fig. 2 in col. 6 lines 23 to 26 also applies.

In respect to the subject matter of Claim 13 which has been here introduced into the specification, Claim 13 applies to a system similar to that described by Claim 9 but using a DC power source as the main source of input instead of an AC source. Clearly Figure 4 of Wilhelm '642 patent permits this mode of operation. For example, conductor lines 523 and 524 permit input of DC power from PV 520 or other DC sources for a DC generator to supply battery at

junctions J1 and J2, as well as DC loads plugged into outlet shown. This discussion is found in col. 8 lines 41 to 55.

In regard to the subject matter of Claim 49, which was not introduced until the filing of the present CPA application on October 12, 1999, if one labels the circuitry within the large rectangle defined by alternate long and short dashes as a "power controller" in Figure 4 of the Wilhelm '642 patent, which was pending when the above-identified application was filed on March 19, 1997, there is shown a:

"power system sharing AC and DC power for powering DC compatible loads ,said power system utilizing a power controller capable of inputting multiple power sources including at least one primary source of AC or DC electrical power."

Also with respect to the subject matter of Claim 49 as filed in the CPA dated October 12, 1999, the variable voltage feature is supported by the control means 522 (see discussion in Wilhelm '642 at col. 8 lines 45-48). It can be argued that the DC-to-DC converter augmented with control means 522 for handling a primary DC source shown in Figure 4 supports

"converting said primary electrical power into a defined DC-regulated voltage used to provide and manage end-use service power".

Moreover, in Fig. 4, connections 523 and 524 can be construed as the one first alternative power connections

while junctions J1 and J2 the "at least one alternative power connection".

The power junction means 55 discussion noted above (supporting the present red ink drawing changes to Figure 10) also supports the last paragraph of Claim 49.

Based upon the above, there is common enabling subject matter for the originally filed independent Claims 9 and 13 for "power systems" in the prior Wilhelm '561 and Wilhelm '642 patents, which also support Claim 49 in the presently pending CPA application filed October 12, 1999.

Since there is continuity of the presently pending Claims with the subject matter of originally filed Claims 9-21 of March 19, 1997, as well as with the foregoing features of Wilhelm '561 and Wilhelm '642, Applicant believes that the carrying over of subject matter from Wilhelm' 561 and Wilhelm '642 as new Figures 12-16 and in the substitute specification related thereto is proper now.

For the foregoing reasons, Application respectfully traverses the Examiner's rejection of prior allowed Claims 4, 25-28, 29, 34, 35, 37-43 and 47. Claim 44, which depends from Claim 43, is also presumed to be allowable.

With respect to the remaining Claims, in view of the amendment herein of Claim 1, it is respectfully submitted that the pending claims more particularly point out distinctly claim the method of the present invention.

Therefore, independent Claim 49 describes a device that forms a universal building power interface that can accommodate the best of both the AC and DC power standards.

Furthermore, Claim 49 defines what is meant by the voltage regulator receiving both the voltage and converted DC electrical power. It also clarifies what is meant by "voltage."

Furthermore, Applicant's Claims concerning the three modes are found in the circuitry of Figure 10, such as, for example, the AC input line, the alternative power source and the storage battery and which are also described in Claims 43 and 47.

For example, there is shown in drawing Figure 10 a photovoltaic PV voltage regulator circuit, a battery under voltage circuit, a voltage regulator and a power junction means controlling all three. These circuits in Claim 49 clarify the voltage regulation features.

While there has been no prior art rejection under 35 USC 103 based on obviousness, in the Office Action of September 12, 2000, pursuant to MPEP 2173.06 and in re Steele, it is submitted that a review of the Claims in view of the prior art is now timely.

For example, it is respectfully submitted that the Claims are distinguishable over any combination of U.S. Patent No. 4,075,504 of Gnaedinger and U.S. Patent No. 4,988,889 of Oughton, or Gnaedinger '504 and Oughton '889 together with US patent no. 4,349,863 of Peterson.

For example, Oughton '889 describes a "low power" oriented power source not a high power building oriented power source. Oughton '889 addresses lighting for such low capacity applications as "EXIT" signs, not area lighting in buildings. The application power levels with Oughton '889, such as "AA" DC batteries, as noted at column 2, lines 24-25, are in the order of a few watts, in contrast to the hundreds and thousands of watts associated with the present invention.

Further note that the regulator in Oughton '889 is not a voltage regulator. It is designed to provide constant current (providing approximate constant power) not constant voltage, as with the present invention. See Abstract of Oughton '889 therein, at lines 3 and 4 and lines 7-10, column 1, lines 42-49, column 2, lines 17 and column 2, lines 28-29.

This means that Oughton's voltage can change in support of a device that may have dynamic changes in resistance. This is necessary to satisfy the specific type of solid-state light source, such as a light-emitting diode (LED), required in the Oughton '889 application.

Furthermore, the circuit in Oughton '889 is dependent upon the characteristics of a light emitting diode which benefits from a constant current source, not a constant voltage source. See column 2, line 17 of Oughton '889.

As a flyback regulator Oughton '889 would not be suitable or practical for the power levels implied with the present invention's application domain or device.

In contrast, the present invention uses a constant voltage device to support the ideal voltage state of a fully charged rechargeable battery that is essentially in parallel with and after the voltage regulator in a mode for longest battery stand-by life. The present invention's system intrinsically provides for charging the battery as required by its constant regulated voltage relative to that battery state of charge voltage until a "float potential" is reached at the battery.

Oughton '889, in contrast, incorporates a battery before the regulator and does not provide a means for charging it, therefore, does not treat it as an integral part of the system as does the present invention.

Also, the technical details of Oughton '889 are quite different from the system of the present invention, which does not use a "flyback converter" as its voltage regulator. This element 12 is the specific type used in Oughton '889. Nowhere in Oughton '889 is the term "voltage regulator" used.

Far from being a general type of voltage regulator, it has auxiliary purposes such as "operating in current limited mode" (see lines 31/32 in column 4 of Oughton '889). Secondly, it appears that Oughton's converter is simply used for feeding into a buck/boost converter 14, which actually

powers the load at all times, even when primary AC power is not available. In the present invention, however, there is no secondary buck/boost converter between the battery and the load.

Furthermore, Oughton '889 is not a high efficiency lighting source with incidental emergency back-up; it is a specialized power source for emergency lighting such as LED's which are being supplied constant power in a varying voltage environment, such as when the battery source is being deeply discharged. The present invention does not function in this manner.

Moreover, neither Oughton '889 nor the present invention provide substantially constant output power to the loads so as not to damage the load with improper voltages.

For example, in the system of the present invention, the voltage regulator is used to keep the battery charged and also by varying the voltage slightly, to effect power sharing among the various DC sources with the AC input. There is little notion of providing constant power output or filtering out damaging voltages. The "constant power output" is the main objective of the buck/boost converter (not the "voltage regulator" 12) in Oughton '889.

Furthermore, Gnaedinger '504 does not produce voltage regulated DC electrical power.

For example, unlike the present invention, Gnaedinger '504 describes a power supply apparatus for a recreational

vehicle which does not filter or voltage regulate the DC power derived from the AC connection.

In contrast to the present invention, Gnaedinger '504 is concerned with the rating of the transformer therein so as to create a priority between the loads L1-L4 and charging the DC battery. In periods of high demand, the battery charging is interrupted.

Also in Gnaedinger '504, the loads L1-L4 can use full wave rectified AC unfiltered (these loads may be incandescent lamps or motor loads, not fluorescent lamps).

Furthermore, in Gnaedinger '504 load L5 is a special load requiring pure DC power which is handled separately.

In addition, in Gnaedinger '504 the battery is disconnected from loads L1-L4 during AC connection by using a relay.

Moreover, in Gnaedinger '504, the circuit is quite inefficient and is not adaptable for high efficiency lighting in offices.

Also, the network of the present invention is different from Peterson. In the present invention's system each controller has its own rechargeable DC power source. In Peterson, it is centrally located and shared. Furthermore, Peterson uses high voltage (i.e. 120 volts) AC or DC that is distributed to each lamp ballast in contrast to the system of the present invention, wherein each ballast requires low voltage DC. No high voltage AC is distributed to the DC lighting ballasts of the present invention.

In summary, by this Amendment, pursuant to MPEP 608.01(1), in relying on the language of originally filed Claims 9-21, Applicant has established a disclosure for a DC power supply system as of March 19, 1997, the filing date of the above identified patent application, not just for a high efficiency lighting system. Moreover, when one examines the substance of these Claims 9-21, one finds common subject matter which is also found in the two earlier parent patent applications of Wilhelm '561 and Wilhelm '642, as noted in the foregoing remarks.

Therefore, in light of the foregoing amendments to the specification and Claims and the foregoing remarks, the rejection of the pending Claims is requested to be withdrawn.

Applicant submits that the application is in condition for allowance, which allowance is earnestly solicited.

Applicant also advises that a currently pending patent application serial no. 09/363,090 filed July 28, 1999 entitled "Balanced Modular Power Management System and Method" contains subject matter similar to and related to the subject matter of the instant application.

Respectfully submitted,

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